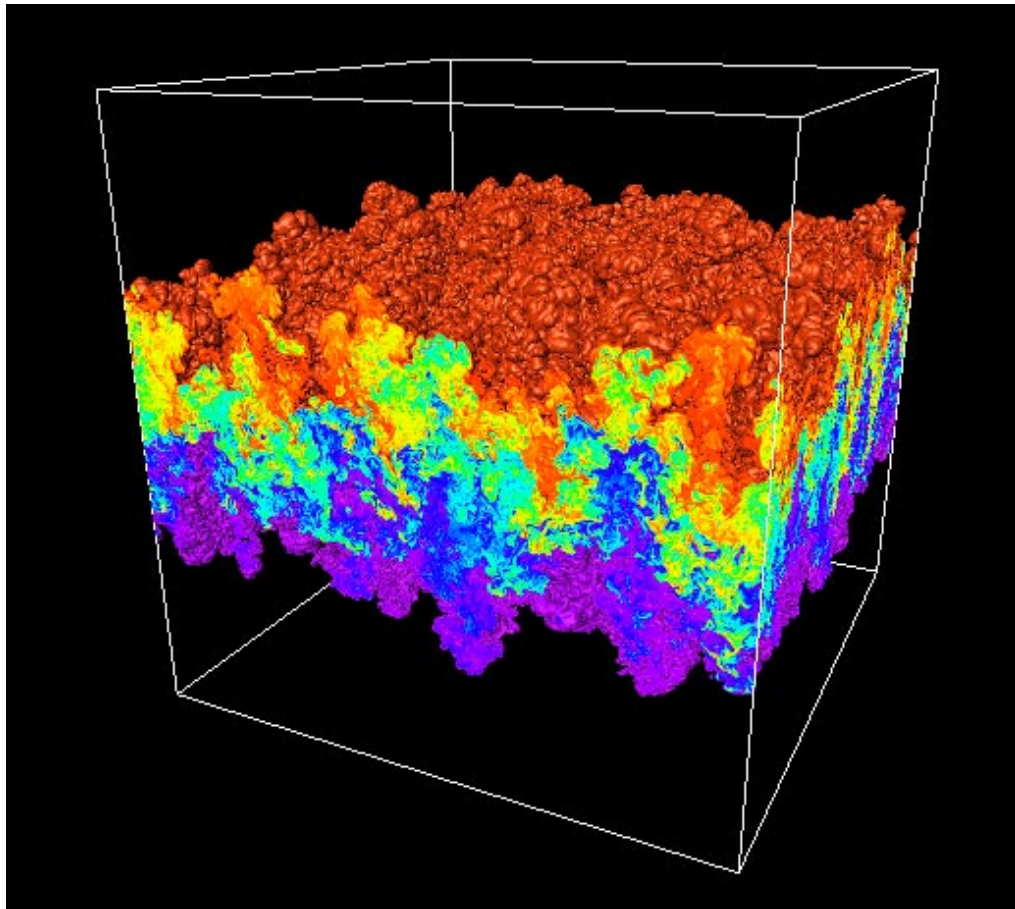


## Rayleigh-Taylor Instability

The Rayleigh-Taylor instability occurs when a light fluid is accelerated into a heavy fluid, and is a fundamental fluid-mixing mechanism that is important to ICF applications. LLNL has employed the MIRANDA code to conduct several very large simulations (including  $720 \times 720 \times 1620$  and  $1152 \times 1152 \times 1152$  meshes) of Rayleigh-Taylor flows. These large-eddy simulations have achieved unprecedented development in the flow, including observations of a mixing transition and early stages of what is likely the first simulation of the truly asymptotic behavior of the instability.



A rendering of the density field from the  $1152 \times 1152 \times 1152$  (1.5 billion zone) Rayleigh-Taylor simulation. The unmixed fluids at the top and the bottom of the problem are not shown. The colors represent various compositions of mixed fluid. Purple is the lightest fluid, red the heaviest.

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